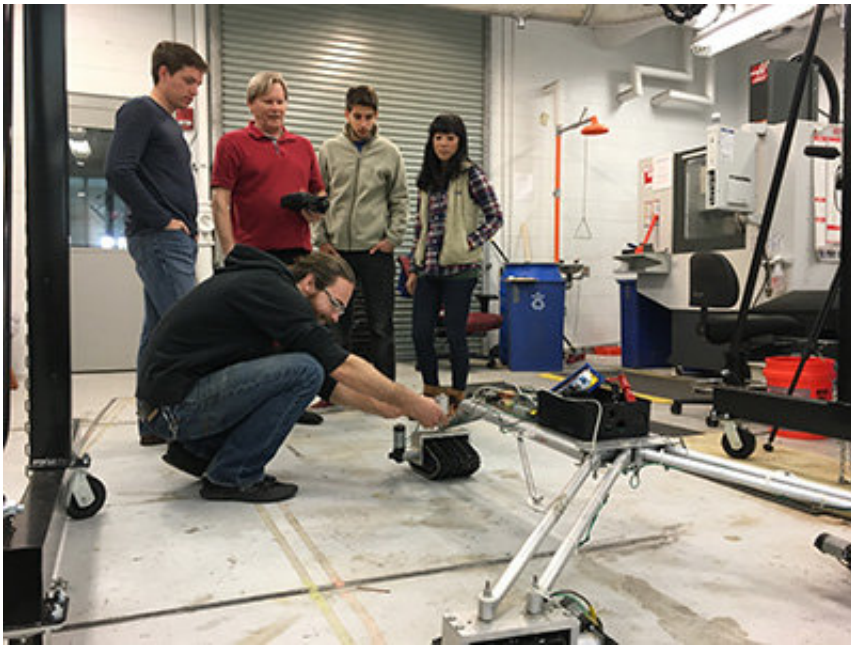


# Engineer invents one-of-a-kind surf rover machine

April 24 2018

---



Dr. William Dally, a University of North Florida civil engineering professor, along with some of his students, operate the complete Surf Rover model scaled to one-quarter the actual size Credit: Joanna Norris, UNF Public Relations Director

For his first job during college, William Dally worked in what he calls the surf zone—the area from the shoreline up to an ocean depth of 25 feet—placing rods to gather scientific data. Battered by the waves, the then 20-year-old civil engineering major thought there must be a better way.

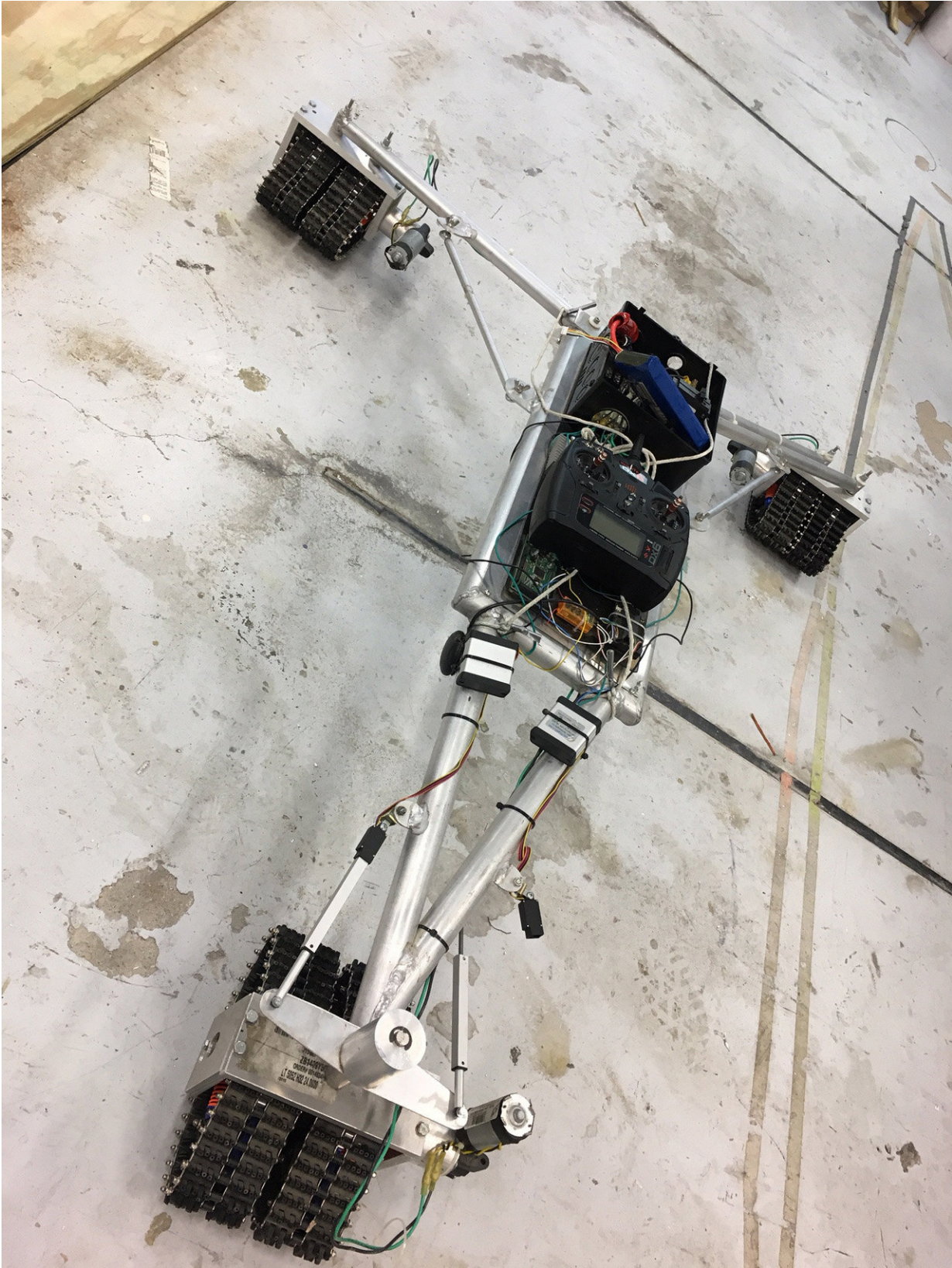
Now an associate professor of civil engineering at the University of North Florida, with a master's degree in coastal engineering and a Ph.D. in engineering mechanics, Dally is hard at work creating what he imagined years ago: a vehicle he calls the Surf Rover.

Dally's [project](#) is being funded by a prestigious Major Research Instrumentation grant that he was awarded from the National Science Foundation (NSF). Though the Surf Rover is a work-in-progress, a complete model scaled to one-quarter the actual size shows a creation that looks part dune buggy and part amphibious crawler, with tank tracks that will allow it to move underwater along the ocean floor.

"When it's complete, it will be the only one of its kind. Others have tried and failed," said Dally, who noted the biggest obstacle is the power requirement. He'll be using a diesel engine that will breathe through a tall snorkel. He stated other engineers have tried electric cords, which are limiting, or batteries, which are heavy and have to be replaced often because they quickly lose power.

Dally and the students working with him—more than 80 students have worked on the project at some point—have designed the Surf Rover to handle the many challenges of the beach environment: soft sand, steep slopes, high waves and strong currents. They're now wrestling with minimizing drag on the tall snorkel and keeping the [engine](#) cool until it submerges in the water.

"It's been challenging and rewarding to apply mechanical, electrical and coastal engineering principles into one project," said UNF engineering graduate student Patrick Cooper, also a Navy veteran. "Knowing how significant the Surf Rover will be in broadening the understanding of the surf zone, it's exciting to know I played a small part in that."



The Surf Rover model scaled to one-quarter the actual size. Credit: Joanna Norris, UNF Public Relations Director

Made from aluminum and stainless steel, the vehicle will weigh more than 3,000 pounds and will measure 16 feet wide and 22 feet long, yet its folding design allows for it to be transported on a modified boat trailer.

The uniqueness of the project ensures it will stand out in the [coastal engineering](#) community, according to UNF engineering graduate student Will Fletcher, also a lieutenant in the Navy, which sent him to the University to work on the project.

"The ability to work on a NSF project like this one has been rewarding because we're helping to create a new piece of scientific equipment that will help us better understand our coasts, oceans and environment," he said.

Dally, who has expertise in civil, coastal/ocean and [engineering mechanics](#), expects to have the Surf Rover ready to be tested in the water and completed next year. He foresees many uses for the metal workhorse.

"Its primary job will be near-shore surveying, determining how the beach changes during storms and what happens to the sand eroded from the beach," he said. "But there may also be a demand in the hydrographic surveying industry, which no longer uses swimmers to go out in the water or boats to come close to shore due to recent accidents."

For the same safety reasons, Dally said the Navy might be interested in using the Surf Rover, rather than divers, to gather information on what's beneath the waves when it needs to build a causeway for a landing or a

rescue operation.

"I've been dreaming of this for a long time," he said. "It's amazing to me that we have vehicles roving surfaces out in space, but we have nothing to help us routinely collect data and make observations in the surf zone on Earth."

Provided by University of North Florida

Citation: Engineer invents one-of-a-kind surf rover machine (2018, April 24) retrieved 4 May 2024 from <https://phys.org/news/2018-04-one-of-a-kind-surf-rover-machine.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.